A REVIEW OF THE SCIÆNOID FISHES OF JAPAN

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BY

DAVID STARR JORDAN and WILLIAM FRANCIS THOMPSON

Of Stanford University, California

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A REVIEW OF THE SCIÆNOID FISHES OF JAPAN.

By David Starr Jordan and William Francis Thompson,
Of Stanford University, California.

In the present paper is given a review of the Japanese fishes belonging to the family of Sciænidæ or Croakers. It is based on the collections made by Professors Jordan and Snyder in 1900, series of these being in the United States National Museum and in the Museum of Stanford University. The drawings are by Mr. William S. Atkinson.

The few Japanese species are all closely interrelated, belonging to the same subfamily, Sciæninæ. They are allied to the numerous Chinese and Indian species.

Family SCIÆNIDÆ.

Body compressed, more or less elongate, covered with rather thin scales which are usually more or less ctenoid. Lateral line continuous, more or less concurrent with the back, extending on caudal fin. Head prominent, covered with scales; bones of the skull cavernous, the muciferous system highly developed, the surface of the skull, when the flesh is removed, very uneven. Suborbital bones without a backward projecting "stay." Chin usually with pores, sometimes with barbels. Mouth small or large, the teeth in one or more series, one series sometimes being enlarged; canines often present. No incisor nor molar teeth; no teeth on vomer, palatines, pterygoids, nor tongue. Maxillary without supplemental bone, slipping under the free edge of the preorbital, which is usually broad. Premaxillaries protractile, but not freely movable. Nostrils double. Pseudobranchiæ usually large, present in most of the genera. Gills four, a slit behind fourth. Branchiostegals seven. Gill membranes separate, free from the isthmus. Lower pharyngeals separate or united, often enlarged, the teeth conic or molar. Preopercle serrate or entire. Opercle usually ending in two flat points. Dorsal fin deeply notched or divided into two fins, the soft dorsal being the longer, the spines depressible into a more or less perfect grove. Anal fin with one or two spines, never more than two. Ventral fins thoracic,

I, 5, below or behind pectorals. Pectoral fins normal. Caudal fin usually not forked. Ear bones or otoliths very large. Pyloric cæca usually rather few. Air bladder usually large and complicated, rarely wanting. Most of the species make a peculiar noise, called variously croaking, grunting, drumming, and snoring; this sound is caused by muscular action on the air bladder. An important family of food fishes found on sandy shores in all warm seas, a few species being confined to fresh waters. None occurs in deep water and none among rocks. Many of them reach a large size, and nearly all are valued for food. All are carnivorous and some are of interest as game fishes.

KEY TO GENERA.

a^1. Preopercle with spine-like teeth, the lowermost largest, plectroid, directed abruptly downward; gill rakers comparatively long and slender, about 8 + 12 to 30 in number ..... *Bairdiella*, 1.

a^2. Preopercle entire, or with feeble serrations, without plectroid spine; gill rakers comparatively short and thick, the number usually 5 to 8 + 8 to 15.. *Sciæna*, 2.

1. Genus BAIRDIELLA Gill.

Bairdiella Gill, Proc. Acad. Nat. Sci. Phila., 1861, p. 33 (*argyroleuca*=*chrysura*).
Nector Jordan and Evermann, Fish. North and Middle America, vol. 2, 1898, p. 1436 (*chrysoleuca*).

This genus is characterized by the oblique mouth, little cavernous skull, few rows of small teeth, slender gill rakers and the preopercle armed with a plectroid spine. It is certainly a very natural group, and worthy of recognition as a distinct genus. The numerous species are all American with one exception. They are all small in size and silvery in coloration, and some of them are remarkable for the great size of the second anal spine. In others this spine is quite small. These variations among species unquestionably closely allied show how slight is the systematic value to be attached to the size of this spine. The single Japanese species has been recorded but once. It belongs to the subgenus *Nector*, and it is related to *Bairdiella armata* from Panama, and to *Bairdiella veræ-crucis* from the Caribbean Sea.

1. BAIRDIELLA ACANTHODES (Bleeker).

? *Bairdiella armata* Gill, Proc. Acad. Nat. Sci. Phila., 1863, p. 164; Panama.
Pseudosciæna acanthodes Bleeker, Verh. Kon. Akad. Wet. Amsterdam, vol. 18, 1879, p. 29, pl. 1; Japan, from a specimen in the Museum at Hamburg.
Bairdiella acanthodes Jordan and Snyder, Check List, Ann. Zool. Jap., vol. 3, pts. 2, 3, 1901, p. 81, name only.

Habitat.—Southern Japan (the record perhaps open to question, as the genus *Bairdiella* is otherwise confined to the warmer parts of America and only the single specimen in the museum at Hamburg is known from Japan).

Description after Bleeker: Specimen described about 225 mm. long. Head $3\frac{3}{4}$ in body, $4\frac{1}{2}$ in total with caudal; depth $3\frac{1}{2}$ in length without caudal, $4\frac{1}{4}$ with caudal; maxillary $2\frac{1}{4}$ in head; longitudinal diameter of eye a little more than 4 in head; interorbital space 4; distance between eye and maxillaries less than half eye; D. X—I, 24 or 25; A. II, 8 or 9; scales in series above lateral line 63, below 53; between first dorsal and lateral line 8 or 9, between ventrals and lateral line 15.

Body oblong, compressed. Head somewhat acute, its height somewhat less than its length; profile straight above eyes; snout shorter than eye, not projecting over mouth, with slight incisions in free edge of skin laterally and medially; upper jaw a little longer than lower; maxillary extending to below posterior half of eye. Mouth very oblique, teeth on jaws anteriorly in a number of series, laterally in two. Internal series on upper jaw very small; external series conical, moderately distant, becoming shorter posteriorly, with no canines. Mandibular teeth in outer row very small and crowded together; inner series conical, moderately spaced, not as large as external teeth of upper jaw, 2 to 4 somewhat larger and much curved teeth just before the symphysis. Pharyngeal teeth acutely conical, lower internal series much longer than the rest. Preopercular breadth about half diameter of eye, posterior margin serrated, at the angle 2 or 3 larger, strong spinelike teeth, the lower longer than the others and pointing downward. Opercle ending in two weak flat points; suprascapular bone denticulated.

Dorsal fins separated to their bases; dorsal spines not very high, thin, rigid, somewhat pungent, third and fourth longer than the rest and contained $1\frac{1}{2}$ in height of body, conspicuously longer than post-orbital part of head; dorsal soft rays about $1\frac{1}{2}$ in dorsal spines.

Pectorals and ventrals pointed, caudal truncate, not much shorter than head without snout. Anal not convex, acutely angled at base, less than one-third length of soft dorsal; second spine very strong, scarcely shorter than head without snout, first soft ray about equal to dorsal spines. Lateral line moderately curved, each scale marked by a simple tube.

Color grayish above, sides silvery, iris yellow; fins yellowish, the vertical fins more or less dusky.

This species is known only from the description and figure of Bleeker, from a specimen in the museum in Hamburg. It is very close to *Bairdiella armata* from Panama, differing chiefly in the presence of 24 instead of 21 rays in the soft dorsal. It is indeed possible that the type is really from South America. The species is also very close to the Atlantic coast analogue of *Bairdiella armata*, *Bairdiella veræ-crucis* Jordan and Dickerson. In this species there are twenty-three soft rays in the dorsal. The relative length of the

dorsal spines is, however, notably different in the two species. In *B. verae-crucis*, the fourth spine is much longer than the third. In *B. acanthodes* the two are subequal.

(*ακανθοδης*, spinous).

2. Genus SCIÆNA (Artedi) Linnæus.

Sciæna ARTEDI, Genera, 1738, p. 65 (two species, the one the basis of *S. cirrosa* Linnæus, the other, complex, the references mostly to the "corb," or the species called later *Corvina nigra*).

Sciæna LINNÆUS, Syst. Nat., 10th ed., 1758, p. 289. (*Umbra; cirrosa*), the name *umbra* including both the "corb" and the "maigre," the descriptive sentence referring to the former, the name *umbra* taken from the *Sciæna umbra* of Hasselquist, 1757, which is the young of the "corb."

Johnius BLOCH, Ichthyologia, vol. 10, 1793, p. 107. (*Carutta*, etc., restricted by Gill to *carutta*.)

Sciæna CUVIER, Règne Animal, 1st ed., vol. 2, 1817, p. 297. (Restricted to *umbra* and *aquila*, the former being regarded as the Linnæan species and therefore as type. It is here identified with the "corb," and the "maigre," *Sciæna aquila* is treated as a non-Linnæan species.) The "corb" is therefore the type of *Sciæna* CUVIER, 1817.

Bola HAMILTON-BUCHANAN, Fishes of the Ganges, 1822, p. 78. (*Coitor*, etc.; in effect restricted to *Bola coitor*, the first species named, by Bleeker and by Jordan and Eigenmann.) *Bola coitor* may be formally selected as type.

Sciæna CUVIER, Règne Animal, 2d ed., vol. 2, 1829. (Restricted to *umbra*, which in turn is now identified with the maigre=*aquila* it being shown that the Linnæan species is complex, including both the "corb" and the "maigre," the maigre being the proper type.)

Corvina CUVIER, Règne Animal, 2d ed., vol. 2, 1829 (*nigra*). (The "corb" now called *nigra*, the maigre being called *umbra*.)

Argyrosomus[a] DE LA PYLAIE, Compt. Rend. Congr. Sci. France for 1834, 1835, p. 534. (*Aquila*, not *Argyrosomus* of Agassiz, 1850=*Leucichthys* Dybowsky.)

Cheilotrema TSCHUDI, Fauna Peruana, Fische, 1845, p. 13 (*fasciatum*).

Rhinoscion GILL, Proc. Acad. Nat. Sci. Phila., 1861, p. 85 (*saturnus*).

Pseudosciæna BLEEKER, Ned. Tydsskr. Dierkunde, vol. 1, 1863 (*aquila; cirrosa* being taken as type of *Sciæna*, as the first species named by Artedi. In this view *Sciæna* replaces *Umbrina*).

Pseudotolithus BLEEKER, Poissons de la Côte du Guinée, 1862, p. 59 (*typus*).

Callaus JORDAN, Rept. U. S. Fish Comm. for 1886, 1889, p. 395 (*deliciosus*).

Nibea JORDAN and THOMPSON, new subgenus (*mitsukurii*).

Othonias JORDAN and THOMPSON, new subgenus (*manchurica*).

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[a] The name *Argyrosomus* first appears, as Dr. Theodore Gill informs us, in the Comptes Rendus du Congrès Scientifique de France, second session in 1834 (published in 1835, pp. 524–534). The article is entitled Recherches en France sur les poissons de l'Océan pendant les années 1832 et 1833, par M. de la Pylaie de Fougères.

On page 534, Professor Gill informs us, M. de la Pylaie has the following:

"Dans la tribus des Persèques, nous voyons * * * l'*Argyrosomus procerus*, nouveau genre que j'ai formé avec le *Sciæna aquila*, Cuv., et auquel, j'associe une nouvelle espèce, l'*Arg. sparoides*, de la baie de Bourg Neuf."

No other reference is made to *Argyrosomus* or to these species. The species, *Sciæna aquila* must be taken as the type of *Argyrosomus*. The name thus antedates *Pseudosciæna* Bloch, given in 1863 to the same species, *aquila*.

Body oblong, more or less elevated and compressed, the dorsal and ventral outlines unlike; mouth low, horizontal or oblique, often with conspicuous slits and pores; lower jaw usually included; teeth in two or more series, the upper series above enlarged, and sometimes the inner below; no true canines; preopercle entire, crenulate or with a few small bony serræ near the angle; no barbels; gill rakers more or less shortened, relatively few, and often thick; lower pharyngeals moderate, separate, with bluntish teeth. Dorsal fins well separated; soft dorsal long; anal short; caudal fin usually rhomboidal; second anal spine moderate or strong; pseudobranchiæ present, air bladder large and complicated; scales moderate, normal.

As here understood, a very large genus, mostly of the Old World, comprising a great variety of forms, which differ widely among themselves, but which form an almost continuous series from *Pseudotolithus* (related to *Corvula* and *Bairdiella*) on the one extreme to *Cheilotrema* at the other.

In *Pseudotolithus* and *Nibea* the preopercle has bony serrations, as in *Micropogon*, and the gill rakers are relatively long and numerous, as in *Corvula*. In *Pseudotolithus* the lower jaw projects. In *Argyrosomus* (*Pseudosciæna*) the lower teeth are few rowed and unequal, while the slits and pores about the mouth are little developed, and the soft dorsal is scaleless.

In the other subgenera the lower teeth are subequal, in bands, and the mouth is smaller, its pores and slits more developed, and the gill rakers are shorter.

In *Johnius* (including *Bola*) the body is elongate and the soft dorsal scaly. In *Sciæna* (= *Corvina*) the body is deep and the soft dorsal naked. In *Cheilotrema* (including *Rhinoscion*) the body is very deep and the soft dorsal scaly. *Callaus* has the general traits of *Argyrosomus*, but with the slits and pores more developed, the gill rakers slender and short, the caudal lunate. In most of the others the caudal is rhomboidal or irregularly S-shaped. It is possible that *Argyrosomus* (including all with the lower teeth unequal) may be set off from the other forms as a distinct genus as in Bleeker's system. In any event, the many species form an almost continuous series from one extreme to the other. The interrelations of these forms have been fully discussed by Jordan and Eigenmann.[a] In the same paper the reasons are given why *Sciæna* should take the place of *Corvina*, the two having the same type, *Sciæna umbra* Linnæus, by the restriction of Cuvier in 1817. *Sciæna umbra* of Linnæus is a complex species, but the diagnosis copied from Artedi is based on the "corb," a fact which justifies Cuvier's first restriction, for which his later view could not properly be substituted. Still more important is the fact that *Sciæna umbra* of Hasselquist,[b] from whose long

[a] Bull. U. S. Fish Comm. for 1886, 1889, p. 395. [b] Iter Palestinum, 1757, p. 352.

description Linnæus took the name *Sciæna umbra*, is the young of *Corvina nigra*.

The subsequent substitution of *Sciæna* for *Umbrina* by Bleeker is not warranted by the rules of the International Zoological Congress.

We follow Jordan and Evermann,[a] in excluding from *Sciæna* the groups called *Sciænops* and *Ophioscion*, both having bony serratures on the preopercle, a distinction probably of small importance.

If we adopt Bleeker's arrangement and separate from *Sciæna* those species with enlarged teeth in the lower jaw, all the Japanese species of this group will stand in *Argyrosomus* (=*Pseudosciæna* of Bleeker).

(*sciæna*, σκιαίνα, the old name, equivalent to *umbra*, from σκία, shade.)

KEY TO SPECIES.

a^1. NIBEA. Preopercle with a few slender sharp spinules; gill rakers relatively numerous and slender; body not greatly elongate (mouth oblique, lower jaw included),[b] soft dorsal naked.

b^1. Body with distinct dark stripes along rows of scales; scales in lateral line about 50; second anal spine very strong, and its length at least twice the longitudinal diameter of eye.

c^1. Dorsal rays X—I, 28; dark oblique streaks along rows of scales continuous, not interrupted above lateral line; gill rakers 7 + 13 (besides rudiments); second anal spine usually $2\frac{4}{5}$ to 3 in head. (Type, however, said to be $2\frac{1}{3}$.) *mitsukurii*, 2.

c^2. Dorsal rays X—I, 31; dark oblique stripes along rows of scales not continuous, interrupted above lateral line; gill rakers 6+10 (besides rudiments); second anal spine larger and stronger than in *S. mitsukurii*, $2\frac{1}{3}$ in head. *albiflora*, 3.

b^2. Body without dark streaks along rows of scales; scales in lateral line 56; second anal spine weak, its length $1\frac{1}{2}$ times diameter of eye; dorsal rays X—I, 28; gill rakers unknown ..... *argentata*, 4.

a^2. ARGYROSOMUS. Preopercle without bony serræ; gill rakers rather few and short; mouth large, oblique; body elongate or not, soft dorsal naked.

b^1. Body rather short, depth $3\frac{1}{4}$ in its length; dorsal rays X—I, 26; second anal spine equal to diameter of eye; peritoneum light colored, not dark, as in *S. nibe;* teeth moderate in size..... *schlegeli*, 5.

b^2. Body rather elongate, depth $3\frac{5}{8}$ in its length; dorsal X—I, 29; second anal spine contained $1\frac{1}{2}$ times in eye; peritoneum very dark or black; teeth large, almost canine-like in outer row of upper jaw..... *nibe*, 6.

b^3. Body extremely elongate; dorsal rays X—II, 26, length 3 or 4 feet. A doubtful species, known only from a very incorrect figure..... *japonica*, 7.

a^3. OTHONIAS. Soft dorsal scaly, otherwise as in a^2 (extra limital)...*manchurica*, 5b.

2. SCIÆNA MITSUKURII (Jordan and Snyder).

NIBE; KUCHI.

Corvina cuja TEMMINCK and SCHLEGEL, Fauna Japonica, Poissons, 1843, p. 58; Nagasaki (not *Bola cuja* HAMILTON, a species from India).

Pseudotolithus mitsukurii JORDAN and SNYDER, Proc. U. S. Nat. Mus., vol. 23; 1901, p. 356, pl. 13; Tokyo.—JORDAN and SNYDER, Check List, Ann. Zool. Jap., vol. 3, 1901, p. 81; Yokohama.

Habitat.—East coast of Japan.

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[a] Fish. North and Middle America, p. 1454, 1898.

[b] In the closely related subgenus, *Pseudotolithus*, the lower jaw is projecting and the body is greatly elongate.

Description from specimens 230 to 335 mm. in length to last vertebra. Head $3\frac{1}{3}$ to $3\frac{2}{3}$ in length, $4\frac{1}{4}$ to $4\frac{1}{2}$ in total with caudal; depth $3\frac{2}{5}$ in body, 4 in total; depth of caudal peduncle $2\frac{4}{5}$ to $3\frac{1}{3}$; maxillary $2\frac{1}{2}$ in head; longitudinal diameter of eye 5 to 6; interorbital space above pupil 3 to $3\frac{1}{3}$; width of preorbital 8 to 10, two-thirds diameter of eye; snout $3\frac{1}{2}$ to 4; D. X—I, 27 to 31; A. II, 7; pectoral 16; scales in lateral line 50, in longitudinal series above 63, below 54, between lateral line and insertion of dorsal 8 or 9; between lateral line and ventrals 12 to 14. Gill rakers 6 or 7+13 (sometimes 4 or fewer rudiments in addition); their length 2 in eye.

Body somewhat compressed; its width about 2 in depth; dorsal outline not greatly arched, curve from snout to caudal peduncle even; ventral outline somewhat less arched; length of abdomen from ventrals to anus $3\frac{1}{5}$ in body length without caudal; length from anus to last vertebra $2\frac{2}{3}$ in body length to base of caudal. Head conical; snout bluntly rounded, its tip nearly vertical but not overhanging; with slight incisions on sides in free edge of skin above premaxillaries; preorbitals flat, not turgid; lower jaw slightly included; maxillary ending below posterior border of eye; cleft of mouth nearly horizontal, tip of premaxillaries being below lower edge of orbit. Teeth in upper jaw in two series; outer ones small, conical; inner ones in a band 2 or 3 rows wide, minute and bristle like; teeth in lower jaw also in 2 series, the inner somewhat larger, especially posteriorly, becoming also minute at mandibular symphysis, the outer teeth in 3 or 4 rows at symphysis, and one scattered row posteriorly, somewhat indistinct. Preopercle with short conical spinules, set in membranaceous border, somewhat larger at angle, but small; those on angle as small or smaller than teeth of upper jaw, not projecting downward. Opercle ending in 2 soft flat points, the upper smaller.

Dorsal spines weak, third or fourth longest, $1\frac{3}{4}$ to 2 in head; dorsal rays even in length $2\frac{1}{4}$ to $2\frac{4}{5}$ in head, last two rays are much shorter; spinous dorsal base 5 in body to last vertebra; soft dorsal base $2\frac{1}{2}$; anal spines stout, strong, second $2\frac{4}{5}$ to 3 in head ($2\frac{1}{3}$ in type), grooved, as in *Sciæna albiflora;* anal base $4\frac{1}{2}$ in that of soft dorsal. Pectorals equal or slightly longer than ventrals, both pointed, $1\frac{1}{3}$ in head. Caudal rounded.

Lateral line arched, following dorsal contour to above anal, from whence it follows center of caudal peduncle to tip of caudal.

Scales ctenoid, save on anterior and lower part of head, a row along soft dorsal and anal; none on spinous dorsal; caudal with few scales, except along lateral line. No scales on other fins. Scales on body in rows as described below.

Pores on snout five, placed as in *Sciæna albiflora*, one median above free edge of skin, a pair on each side opening on edge, the outermost in the incision. Pores on mandible prominent, one central, imme-

diately below symphysis, a pair on either side, those outermost farthest apart, a row of minute indistinct pores on either side, extending from halfway back on mandible to its articulation.

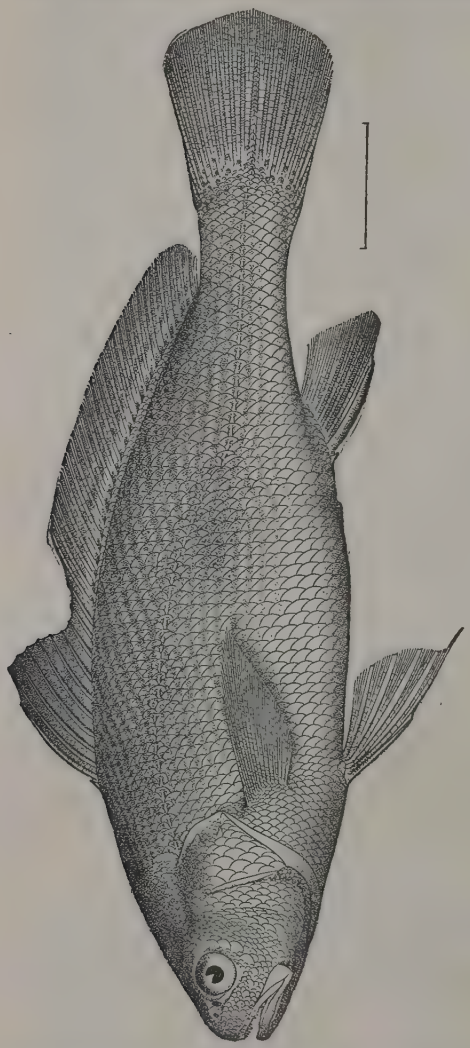

FIG. 1.—SCIENA MITSUKURII.

Air bladder with twenty-four or twenty-five lateral appendages, arborescent anteriorly, less so posteriorly, the posterior end with four or five unbranched appendages, the body of air bladder terminating in a long point.

Color in alcohol silvery, darker above than below, sheath of each scale above level of lower pectoral rays with a central dark spot forming stripes along each row of scales equal to half diameter of pupil in width, from occiput to posterior half of soft dorsal obliquely upward, that from scapular flap rising to first soft rays; three lowermost under posterior half of soft dorsal become parallel to lateral line and pass to end of caudal peduncle, those above still oblique to end of dorsal. Those lines below lateral line nearly parallel to body axis, but rising somewhat to meet lines above until opposite anal fin, where they become parallel to lateral line. Scales along soft dorsal base colorless, breaking scale lines which are continued on

both dorsal fins by a brown spot at base of each ray. Dorsal and caudal fins marked with brown on membranes, spinous dorsal bordered by darker, an indistinct spot in upper axil of pectoral and upper angle of opercle. Anal stippled with brown, other fins colorless. Gill chambers lined with dark, peritoneum clear.

The following is a list of measurements of the type-specimen in hundredths of body length.[a] "Length of body 171 mm.; length of head 28; depth of body 30; distance from snout to dorsal 71; depth of caudal peduncle 10; length of snout 7; length of maxillary 12; diameter of eye 6; width of interorbital space 8; length of base of spinous dorsal 20; length of base of soft dorsal 43; length of second dorsal spine 12; third dorsal spine 15; length of longest dorsal ray 12½; length of base of anal 8½; length of first spine 2; second spine 12; length of first ray 16; length of longest pectoral 20; ventral 21; caudal 22." Our specimens showed the following measurements: Head 27 to 30; diameter of eye 5 to 5½; length of third dorsal spine 15 to 17; second anal spine 10 to 11.

The species seems to be rather rare in Japan, the specimens examined by us from Tokyo, Awa, Matsushima, and Wakanoura being the only ones known, unless it should prove that the specimen from the Inland Sea of Japan recorded by Regan as *Sciæna albiflora* belongs to this species.

The fish is called Nibe or Kuchi at Wakanoura.

This is probably the species incorrectly recorded by Schlegel as *Sciæna cuja*. The Indian species, *Sciæna cuja*, is similarly marked, but the anal spine is much larger.

(Named for Kakichi Mitsukuri.)

3. SCIÆNA ALBIFLORA (Richardson).

Corvina albiflora RICHARDSON, Ichth. China, 1846, p. 226; Canton.

Sciæna albiflora GÜNTHER, Cat. Fish. Brit. Mus., vol. 2, 1860, p. 284; Ann. Mag. Nat. Hist., 1873, p. 378; Chifu.—STEINDACHNER, Denkschr. k. k. Akad. Wiss. Wien, 1892, vol. 59, p. 361; Shanghai.—REGAN, Ann. Mag. Nat. Hist., ser. 7, vol. 15, 1905, p. 20; Inland Sea of Japan.

Pagrus macrocephalus BASILEWSKY, Ichth. Chin. Bor., 1855, p. 222, pl. 3, fig. 1; Tschili; Peking. (Coloration well shown; dorsal fin incorrect.)

Pseudosciæna mitsukurii JORDAN and STARKS, Proc. U. S. Nat. Mus., vol. 31, 1907, p. 520; Port Arthur (not of Jordan and Snyder).

Habitat.—Coasts of China, once recorded from the Inland Sea of Japan.

Description of specimen from Port Arthur, 320 mm. long with caudal. Head 3⅔ in length without caudal, 4½ with caudal; depth 3½ in length, 4⅓ with caudal; maxillary 2⅓ in head; longitudinal diameter of eye 5; interorbital space 3⅜; breadth of preorbital between eye and maxillaries ⅔ diameter of eye, 7 in head; snout 4 in head; dorsal rays

[a] Copied from Jordan and Snyder, Proc. U. S. Nat. Mus., vol. 23, p. 357.

X—I, 31; A. II, 7; scales 52 in lateral line, 84 in transverse rows above, 72 below, between insertion of dorsals and lateral line 9 or 10, between lateral line and ventrals 18. Gill rakers 6 + 10 (and 3 or 4 rudiments); their length one-third diameter of eye.

Body somewhat elongate and compressed, its width twice in depth; dorsal profile evenly arched from snout to base of caudal peduncle, ventrally somewhat less convex; length of abdomen from ventrals to anus about 3 in length to base of caudal; distance from anus to last vertebra $2\frac{1}{2}$ in body. Head conical, dorsal profile little arched, interorbital space only slightly convex from side to side; snout short, blunt, broadly rounded, very convex dorsally, its tip vertical, or slightly overhanging premaxillaries. Suborbitals somewhat broad, flat. Lower jaw much shorter, included. Maxillary extending to vertical from last fourth of eye. Cleft of mouth oblique, anteriorly below level of lower eye by nearly one-third diameter of eye. Teeth in upper jaw in two bands; outer one row of larger, widely set, conical

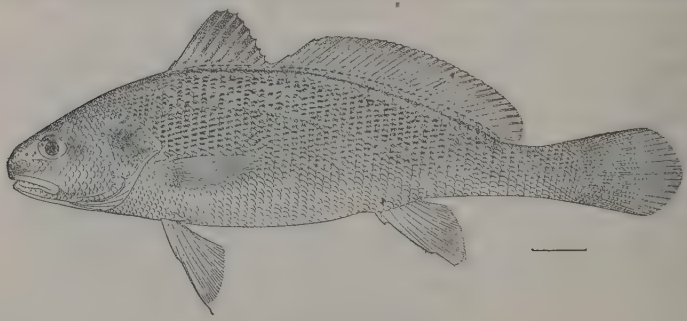

FIG. 2.—SCIÆNA ALBIFLORA.[a]

teeth, stronger than remainder, but hardly canines; inner of a band of minute bristle-like teeth, 3 or 4 rows wide. In lower jaw an inner single row of very small teeth, but somewhat larger than outer, closely set, conical, moderately stout, with an outer band of bristlelike, minute teeth, 4 or 5 rows wide at symphysis, but laterally only 2 or 3.

Preopercle with rather firm, strong, bony teeth or spines a little larger than inner row of mandibles, becoming larger and more widely set at the angles than on upper and lower edges. Opercle with two flat points, the lower somewhat larger.

Dorsal spines weak, third and fourth highest, about twice in head, first dorsal rays $1\frac{2}{5}$ in length of third spine and $2\frac{3}{4}$ in head, those posterior not increasing much in height, the last four decreasing rapidly, the last about equal to the diameter of the eye. Soft dorsal base contained $2\frac{1}{3}$ in body, that of spinous dorsal five times. Anal higher than soft dorsal, first soft ray equal or somewhat longer than

[a] The scales on this drawing were miscounted. See description.

third dorsal spine. Second anal spine fluted, showing an appearance of longitudinal layers, strong and long, its length $2\frac{1}{3}$ in head, first spine short but stout, about one-third diameter of eye. Anal base $4\frac{1}{2}$ times in soft dorsal base. Pectorals pointed, fourth ray longest, rather short, being contained $1\frac{1}{3}$ in head. Ventrals a trifle shorter, $1\frac{1}{2}$ in head. Caudal irregularly rhomboidal, the upper half having its border somewhat concave, its length $1\frac{1}{4}$ in head.

Lateral line arched anteriorly, dropping slightly posteriorly from parallel to line of back, until opposite insertion of anal at which it becomes straight along center of caudal peduncle to tip of caudal.

Scales strongly ctenoid, except on lower surface of head and preorbitals. Rows of scales on body oblique to lateral line, those from scapular flap ending at middle of spinous dorsal, those from upper rays of pectoral meeting lateral line slightly posterior to below first rays of soft dorsal but continued above to its center. Those posteriorly gradually becoming less oblique until parallel on caudal peduncle. Soft dorsal with a basal sheath of two rows, anal similar, caudal scaled at base, and halfway to tip along membranes. On lateral line anteriorly two small scales between the scales bearing pores, posteriorly on caudal peduncle none, midway one small scale only.

Pores well developed on snout. Lower jaw with a large central pore below symphysis; a large pair just behind; and a slit-like pair just behind these and farther apart; halfway back on mandible of each side a row of small closely set pores extending back to articulation of mandible.

Air bladder pointed sharply posteriorly, with 25 or 26 small lateral arborescent appendages.

Body white, below level of pectorals; above this the sheath of each scale has a brown spot, making brown stripes along each row of scales running obliquely as described for scale rows, but much interrupted and broken above lateral line, where a longitudinal clear space or indefinite line of unpigmented sheaths runs along one or two scales below the line of the back, and another midway between this and the lateral line, becoming still more indefinite anteriorly. Lateral line interrupting these lines on its curved anterior portion. Rows of scale sheaths along bases of dorsals also colorless, but the lines continued on dorsals by a brown spot at base of each ray or spine and another on the membranes a little higher up, smaller and less distinct. Upper part of head very dark, as is upper part of preopercle and opercle, the latter almost covered by a dark blotch. In pectoral axil a small deep blackish spot on inner bases of rays, continued a distance on rays. Dorsals broadly edged with brownish black on distal halves, the spinous dorsal more strongly. Caudal dusky. Other fins colorless. Gill cavities very dark. Peritoneum white, as is mouth cavity.

The following is a list of measurements of our specimen in hundredths of body length to base of caudal: Head 27; depth 28; eye $5\frac{1}{2}$; snout 7; maxillary 11; interorbital space above pupils 8; space between eyes and maxillaries 4; second anal spine 12; pectoral length 20; third dorsal spine 14; longest dorsal ray 10.

From *Sciæna mitsukurii*, to which this species is closely related, it may be readily known by the broken character of the stripes above the lateral line, the stronger preopercular teeth, and by the broader band of bristle-like teeth in the lower jaw. In *S. mitsukurii* the lateral stripes become parallel to the lateral line under the last half of the soft dorsal, whereas in *S. albiflora* this is not true until the last rays are reached.

This species is known to us only from the descriptions of authors, and from the specimen from Port Arthur, described above. This specimen we here figure.

It seemed to us possible that the specimen recorded by Regan from the Inland Sea of Japan is really *Sciæna mitsukurii*, which closely resembles this Chinese species. In fact except for the differences in the dark streaks along the rows of scales there is little difference between the two species. At our request, however, Mr. Regan has reexamined his specimen and he reports that it is identical with *Sciæna albiflora* from China. It is therefore different from *S. mitsukurii*.

(*albus*, white; *flor*, flower; from the Chinese vernacular name.)

4. SCIÆNA ARGENTATA (Houttuyn).

Sparus argentatus [a] HOUTTUYN, Act. Haarlem, vol. 20, pt. 2, 1782, p. 320; Nagasaki. (Not *Sciæna argentata* Gmelin, 1788, which is based on *Sciæna argentimaculata* Forskål, 1776, a species of *Lutianus*.)

Corvina argentata CUVIER and VALENCIENNES, Hist. Nat. Poiss., vol. 5, 1830, p. 115, after Houttuyn.

Sciæna bleekeri DAY, Fishes India, 1876, p. 185, pl. 45, fig. 4; Bombay, Gwadur.—STEINDACHNER and DODERLEIN, Denkschr. k. k. Akad. Wiss. Wien, vol. 48, 1883, p. 33; Tokyo.

Corvina yeddoënsis DODERLEIN, MS., Denkschr. k. k. Akad. Wiss. Wien, vol. 48, 1883, p. 33; Tokyo. Same specimen.

Habitat.—Southern Japan to India.

Description, after Steindachner, of specimen about 40 cm. long: Head $3\frac{3}{8}$ in length to base of caudal, $4\frac{1}{6}$ to $4\frac{1}{4}$ in total length; depth 4

[a] This is a translation of the original description of *Sparus argentatus* Houttuyn:

This fish is thicker of body and less broad than the preceding ("*Sparus auratus*") though not higher than broad. At first sight it resembles the haddock in the silver glow of the scales and the dark blotch behind the opercles, these as well as the whole head being scaly. This the learned Gronovius makes a mark by which to know the Spari from the Labri. The curving of the side stripe, which is here visible, is, according to Linnæus, another mark. Of the dorsal fin the 9 first rays are spiny, the 26 soft. The pectoral has 16, the ventrals 9, as well as the anal fin of which the first is a spine. The caudal fin 18. The length of the object is nearly 8, the thickness $2\frac{1}{2}$ inches.

The account of the black pectoral spot shows that Houttuyn had this species in mind and not the more common *Sciæna schlegeli*.

in length to base of caudal, $4\frac{2}{3}$ in total; interorbital space $4\frac{3}{4}$ in head; longitudinal diameter of eye $5\frac{3}{5}$; snout more than $3\frac{4}{5}$; dorsal rays X—I, 28 (24 to 27, Day); anal II, 7; scales in lateral line to base of caudal 56 (60, Day), in longitudinal series above 90, below 74, between dorsal and lateral line 10, between lateral line and ventrals 18. Gill rakers not described.

Body elongate; head compressed, conical, blunt. Dorsal profile of head and occiput ascending but moderately and evenly to insertion of dorsal, line of back descending still more gradually to caudal peduncle, the least height of which is contained $2\frac{2}{3}$ in body depth. Greatest depth of head equal to its length without snout. Cleft of mouth moderately long, somewhat oblique, maxillary reaching a little behind center of eye, posterior end rounded. Lower jaw little shorter than upper. Premaxillaries with a loosely set row of canine teeth, the anterior 4 or 5 on each side prominent for their size, the remainder a narrow band of close set, minute, bristle-like teeth. In lower jaw only two rows, the inner large and set farther apart, becoming gradually longer and stronger posteriorly but less so than anterior canines in upper jaw. Posterior edge of preopercle nearly vertical, set with not very numerous, delicate spinules, which are slightly larger toward the angle, three noticeably larger flat teeth at the angle. Two flat points on posterior end of opercle.

First dorsal spine short, buried beneath skin at foot of second, whose length is contained $2\frac{3}{5}$ times in head. Fourth and highest nearly equal to half head. Next to last slightly shorter than last, which is equal in length to eye diameter. First soft dorsal ray somewhat shorter than second spine, those following increasing but slightly in height to sixth; from sixth to fifteenth equal; from fifteenth a gradual shortening, becoming rapid in last four rays. Second anal spine straight, exceeding middle dorsal spines only slightly in strength, its length $1\frac{1}{2}$ times eye diameter, about $1\frac{3}{4}$ in first soft anal ray whose height is nearly half that of head. Length of anal base contained $4\frac{1}{2}$ times in that of soft dorsal. Ventrals equal to pectorals in length, both pointed; and contained $1\frac{3}{5}$ times in length of head, the former not extending quite halfway to insertion of anal. Caudal irregularly rhomboidal.

Body scaled everywhere save on lips, upper jaw, and around point of lower jaw; on bases of soft dorsal and anal a low sheath of scales.

Pores present on lower surface of mandible, groove-like, two opposite at symphysis.

Color silver gray, below somewhat lighter. On opercle a very large indefinite dark gray spot; on posterior base of pectoral axil extending back and down, a sharply defined, intensely colored blotch of soiled blue violet.

This species was not seen by us. It must be rare in Japan, as the single specimen recorded by Steindachner and Doderlein is the only one known from outside of India. The specimen brought from Nagasaki by Professor Thunberg and roughly described by Houttuyn must be the same, as is shown by the black pectoral spot, compared to the blotch on the haddock.

(*argentatus*, silvered.)

5. SCIÆNA SCHLEGELI (Bleeker).

ISHIMOCHI (STONE-POSSESSOR).

Corvina sina TEMMINCK and SCHLEGEL, Fauna Japonica, Poissons, 1843, p. 58, pl. 24, fig. 2; Nagasaki, bays of the southwest coast of Japan.—BLEEKER, Verh. Batavia Gen., vol. 26, 1857, p. 82; Nagasaki. (Not *Corvina sina* of CUVIER and VALENCIENNES, a Chinese species.)

Pseudosciæna schlegeli BLEEKER, Poissons du Japon, Verh. Kon. Akad. Wet., Amsterdam, vol. 18, p. 9, 1879; Nagasaki, Yedo (after Temminck and Schlegel).

Sciæna schlegeli STEINDACHNER and DODERLEIN, Beitr. Fische Japans, vol. 2, 1883, p. 33; Tokyo.

Corvula schlegeli JORDAN and SNYDER, Check List, Ann. Zool. Jap., vol. 3, 1901, p. 81; Yokohama.

Habitat.—Sandy bays of Japan.

Description of an example 170 mm. in length, taken at Onomichi: Head 3 to $3\frac{1}{3}$ in length to base of caudal, $3\frac{2}{3}$ in total; depth 3 to $3\frac{1}{3}$ in body, $3\frac{1}{3}$ to $3\frac{2}{3}$ in total; maxillary $2\frac{1}{4}$ to $2\frac{1}{3}$ in head; longitudinal diameter of eye 4 to $4\frac{2}{3}$; interorbital space above pupil $3\frac{1}{3}$ to $3\frac{1}{2}$; width of preorbital 6 to 7; snout $3\frac{1}{3}$; dorsal X—I, 25 to 27; anal II, 7 or 8; scales in lateral line 50, in series above 50, below 50, between dorsal and lateral line 8 or 9; between lateral line and ventrals 9 or 10. Gill rakers 6+8 or 9 (and 2 or 3 rudiments), length two-fifths eye diameter, one-half in very young.

Body somewhat deep and compressed, its width $2\frac{1}{2}$ times in its depth. Dorsal and ventral outlines equally convex. Abdomen from anus to ventral base 3 in body to last vertebra; distance from anus to last vertebra a little more. Profile of head slightly concave over eyes, convex from side to side. Snout full, descending in a strong curve to tip, slightly overhanging it. Lower jaw a trifle shorter than upper. Maxillary extending to a vertical from posterior margin of pupil. Cleft of mouth oblique, at about an angle of 25° to 30° to body axis. Premaxillaries curved downward in posterior half; their anterior ends at or slightly below level of lower orbit edge. Teeth in two rows on both jaws; outer row largest on premaxillaries, becoming large and strong, canine like, anteriorly on either side of symphysis; inner row largest on dentaries, increasing in size posteriorly but not becoming as large as those of premaxillaries in outer row at symphysis. Inner row above and outer row below on jaws small, conical, distinct from enlarged rows. Gill rakers thick and rather short in adult. Space between orbits and maxillaries moderately broad, two-thirds longitudinal diameter of eye. Preopercular margins with dis-

tinct flexible serrations, more widely set and somewhat larger on rounded angle, less prominent on lower edge than on posterior margin; the latter sloping backward, at slight angle from vertical. Opercle ending in two large flat points of about equal size.

Dorsal spines weak, flexible; longest third and fourth, 2½ in head and 1½ times length of dorsal rays; base of spinous dorsal slightly more than half that of soft, which is contained thrice in length of body to base of caudal fin. Anal spines very weak, first buried beneath skin, second equal to longitudinal diameter of eye in length; longest anal rays 2½ in head, anal base 4½ in that of soft dorsal, its insertion under thirteenth to fifteenth soft dorsal rays. Pectoral somewhat longer than head without snout. Ventrals reaching over half way to vent. Caudal rounded.

Lateral line distinct, concurrent with base of dorsals to above anus, where it follows body axis to tip of caudal; its tubes large, arborescent, one or two branches on a side.

Scales slightly ctenoid over whole body save on cheeks below eye; absent on lips; buried on lower surface of mandible; a sheath-like row along bases of soft dorsal and anal, which are not scaled.

Color silvery on sides and cheeks, in spirits light brownish above lateral line, colorless below, a large indefinite black, pigmented blotch on operculum and a smaller one on inner side of axis of pectoral. Fins all pale save dorsal margins which are somewhat darkened on distal half, and bases of soft rays which are also dusky, leaving a clear stripe midway up on second dorsal.

We have numerous examples from Tokyo, Onomichi, Tsuruga, Naoetsu in Echigo, Hiroshima, Kawatana, and Nagasaki. These agree well with the description given by Steindachner and Doderlein in "Beitrage zur Kenntniss der Fische Japans," and with the account of *Corvina sina* given by Schlegel in the Fauna Japonica.

The species is one of the commonest food fishes of the sandy shores of southern Japan, where it is known as Ishimochi, or stone-possessor, from the ear bones.

(Named for Professor Schlegel.)

The species from Port Arthur recorded as *Corvula argentata* by Jordan and Starks [a] is not identical with this Japanese species.

It may be described as follows:

5b. SCIÆNA MANCHURICA Jordan and Thompson, new species.

Description of eight specimens from Port Arthur, type 285 mm. in total length: Head 3⅓ in length without caudal, 4 with caudal; depth 3⅚ in length without caudal, 4½ with caudal; maxillary 2 in head; eye 5½; interorbital space above center of eyes 3; preorbital width between eyes and maxillaries 9½ or 10; snout 4; dorsal IX—I,

[a] Proc. U. S. Nat. Mus., vol. 31, 1906, p. 518.

32; anal II, 9 or 10; scales in lateral line 60, above in longitudinal series 65, below 72, in transverse series 5 or 6 between insertions of dorsal and lateral line, between lateral line and ventrals 12 or 13. Gill rakers 9+18 (fully developed), length about two-thirds diameter of eye.

Body not greatly elongate, compressed, its width twice in its depth. Dorsal profile evenly arched, that along back somewhat more gradually than from snout to dorsal; ventral profile not much arched; abdomen from ventrals to anus 3 in length of body without caudal; caudal from anus to last vertebra 3. Head cavernous, compressed, its width 1½ times its depth; snout rounded, not strongly convex in profile nor overhanging premaxillaries; preorbitals but little convex; jaws equal or lower somewhat shorter, narrow, included anteriorly and laterally so that teeth of upper jaw close outside of lower jaw; maxillary extending to below posterior border of eye; mouth cleft, very oblique, at 40° or 45° to body axis; premaxil-

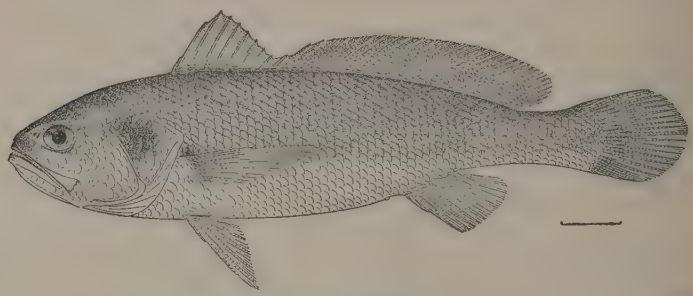

FIG. 3.—SCIÆNA MANCHURICA.

laries in level of lower edge of pupil and above that of orbit. Teeth in two rows in upper jaw; the outer of small hooked teeth larger anteriorly; the inner bristle-like, in a band posteriorly in one row at middle of upper jaw, lacking in anterior third, but present again in a single row at junction of premaxillaries. In lower jaw but one row of hooked teeth somewhat larger than those in the upper jaw, well spaced and larger posteriorly, small anteriorly save for a larger one on each side of the mandibular symphysis; between these a few small bristle-like teeth. Border of preopercle membraneous crenate, set with minute, radiating, flexible spinules. Opercle with two points, close together, the upper much smaller, indistinct.

Dorsal spines weak, highest from third to fourth and fifth, the former 2⅓ in head, the last adnate to the first soft ray and nearly equal in length to the next to last. Dorsal rays 3 in head, of nearly equal length throughout, save the last two, which are somewhat shorter. Base of spinous dorsal 5¼ in body, that of soft dorsal 2⅓.

Pectorals pointed, rather long, 4 in body, $1\frac{1}{6}$ in head, sixth and seventh rays longest. Ventrals $2\frac{1}{2}$ in depth, $1\frac{1}{2}$ in pectorals; caudal evenly rounded, about two-thirds length of head.

Lateral line without angle over base of anál, curving down from anterior end somewhat more strongly than line of back, then becoming gradually parallel to axis of body above anal, thence running on middle of caudal peduncle to tip of caudal, its tubes prominent, large, their branches small, usually one on each side, with many subbranches.

Scales present everywhere on body save lips and tip of snout; soft dorsal and anal with small delicate scales from bases to tips; caudal scales on basal third and on membranes to tip. Rows on body oblique, that from scapular flap ending at eighth ray of soft dorsal. Scales ctenoid on body, cycloid on head.

Pores on snout five, one median, a pair on either side opening on free edge of skin, the outermost in a slight emargination of the edge, lobes not present. Pores indistinct on lower jaw, a central one opposite symphysis and a pair just behind.

Air bladder pointed posteriorly, with 25 or more lateral arborescent appendages.

Color uniformly dark above and on sides to level of middle rays of pectoral, where it is sharply divided from clear silvery ventral surface; lower edge of pigmented surface in perfectly straight line to caudal, leaving lower third of caudal peduncle also clear and colorless. Lines of deeper color running along base of dorsal, along edge of premaxillaries, on upper and lower borders of orbits and narrowly along edges of dorsals. Dorsal surface of head and snout darker, cheeks silvery; a dark blotch, indistinctly limited on opercle, and one just above axil of pectoral at bases of its upper rays. A dark indefinite blotch behind last rays of dorsal, on upper surface of caudal peduncle. Caudal somewhat dark, other fins clear and colorless save for slight stippling of black on pectorals. Gill cavities black, mouth colorless, peritoneum dark, sometimes nearly black.

The following is a list of measurements of the type specimen, in hundredths of body length: Length 240 mm. to last vertebra; head 30; depth 27; distance from anus to last vertebra 34; anus to ventrals 35; eye $5\frac{1}{2}$; snout 7; maxillary 14; interorbital space 10; third dorsal spine 14; longest dorsal ray 10; pectoral 25; second anal spine 4; base of spiny dorsal 19, of soft dorsal 43, of anal 11.

The type here figured is Cat. No. 67330, U.S.N.M. A cotype is in Stanford University.

It differs from the type of the subgenus *Argyrosomus*, and from all the Japanese and most of the Chinese Sciænidæ in the scaly soft dorsal fin. It may be made the type of a new subgenus *Othonias*, distinguished from *Argyrosomus* by this character.

6. SCIÆNA NIBE Jordan and Thompson, new species.

? *Sciæna japonica* TEMMINCK and SCHLEGEL, Fauna Japonica, Poissons, 1843, p. 58, pl. 24, fig. 1; Nagasaki, after a Japanese drawing.

Habitat.—East coast of southern Japan.

Description of three specimens.—Length 305, 345, 385 mm. with caudal, the longest taken as the type, a sexually mature specimen. Head 4 in total length, $3\frac{1}{3}$ in length to base of caudal (to last vertebra); depth $3\frac{5}{6}$ to $3\frac{4}{7}$ in latter; length of maxillary 2; longitudinal diameter of eye $3\frac{3}{4}$ to $4\frac{1}{2}$; breadth of interorbital space over pupil 3 to $3\frac{1}{3}$; breadth of preorbital between eye and maxillary 10 in head, $2\frac{1}{3}$ to $2\frac{2}{3}$ in eye; snout $3\frac{1}{3}$ in head; dorsal rays X—I, 29 or 30; A. II, 7; scales in lateral line to last vertebra 52; number of transverse series above lateral line 50, transverse series below lateral line 50; between dorsal insertion and lateral line 7 or 8, between lateral line and ventrals 15; gill-rakers 6 to 8+10 or 11 (and 3 or 4 rudiments on lower arch).

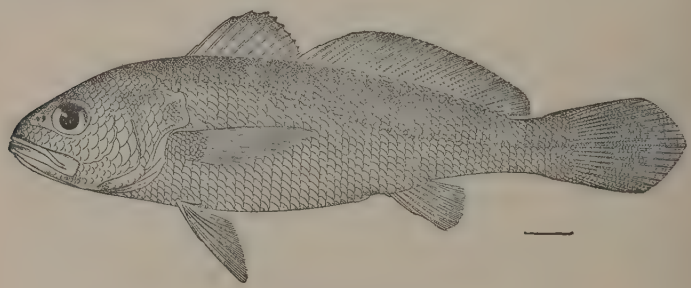

FIG. 4.—SCIÆNA NIBE.

Body elongate, heaviest in anterior half, somewhat compressed, its width $1\frac{1}{2}$ in its depth. Dorsal profile not much arched from snout to insertion of dorsal, almost straight above eye, descending in long, gradual slope to caudal peduncle from insertion of spinous dorsal; ventral profile evenly convex. Abdomen from ventrals to vent slightly longer than head; length of caudal peduncle from last anal rays to last vertebra $1\frac{1}{3}$ in head; head conic, compressed, its width $1\frac{1}{2}$ in its greatest depth; snout rounded, blunt, not overhanging premaxillaries, but convex in profile; suborbital space somewhat narrow, flat; jaws subequal or lower slightly longer; maxillary extending to below center of eye; mouth oblique, anteriorly on level of lower border of eye. Teeth in two rows on both jaws; outer row largest, well spaced in upper, becoming canine-like anteriorly, smaller posteriorly, sometimes more prominent enlarged hooked teeth below slits of free edge of skin on snout, showing externally; inner row minute, closely set, well separated from outer row; on lower jaw inner row largest, spaced as outer in upper jaw, becoming largest

in middle of each dentary, but not as large as canines in upper jaw; outer row minute, closely set, not well separated from inner. Gill-rakers one-half diameter of eye, heavier and stouter in larger specimens. Preopercular angle blunt, rounded; posterior edge sloping slightly obliquely back from vertical, lower edge curved; both edges with minute spinules set in membraneous border, slightly larger at angle. Opercle ending in two flat points nearly equal in size.

Dorsal spines weak, short; third and fourth longest, third $2\frac{1}{3}$ in head; dorsal rays shorter, $1\frac{1}{6}$ in third spine; base of soft dorsal $1\frac{1}{3}$ times length of head, base of spinous dorsal slightly more than half base of soft. Anal base 5 in soft dorsal base, its first spine very small, hidden, its second 5 to 6 in head, $1\frac{1}{3}$ to $1\frac{1}{2}$ in eye, and about two-fifths to one-half first soft ray. Pectorals long, equal to body depth, $1\frac{1}{6}$ in head; ventrals shorter, at most $1\frac{1}{2}$ in head, reaching more than half way to vent; caudal rhomboidal.

Lateral line running somewhat more obliquely downward than line of back to above anal fin, thence along middle of caudal peduncle to tip of caudal, its tubes arborescent, more so anteriorly.

Scales ctenoid, present everywhere save on lips and lower surface of lower jaw at tip, buried on snout, preorbitals and on lower jaw where present; rows on sides very oblique, that arising at scapular flap ending near last of first dorsal base; a sheath-like row of scales along bases of soft dorsal and anal, the fins otherwise scaleless.

Pores on snout well developed, five in number, a central one just above free edge of skin, a large slit-like pair in emarginations found to either side, and one on each side between the latter pair and the central, the paired slits opening on the edge. Below symphysis of lower jaw four, two immediately below, and two larger ones farther back and farther apart.

Air bladder with 24 or 25 lateral arborescent branches on each side.

Color, silvery on sides and cheeks, slightly darker above along bases of dorsals; a dusky very indefinite blotch on operculum, a small intensely black spot on axil of pectoral above and behind, mostly hidden by the fin; snout and anterior edges of lips dark; pectorals slightly pigmented on upper surface and on distal half; spinous dorsal with a very narrow border of black, other fins colorless; gill cavities and peritoneum black or very dark.

The following is a list of measurements of the type, 310 mm. long to base of caudal, in hundredths of body length: Head 30; eye 7; snout 9; maxillary 14; interorbital space 9; distance between eye and maxillary 3; length of abdomen from ventrals to anus 32; pectorals 25; second anal spine $5\frac{1}{2}$.

Of this species we have three examples taken by Jordan and Snyder at Wakanoura the type (Cat. No. 67331, U.S.N.M.), a female with mature eggs, and two others in the collection of Stanford University.

The species must be relatively rare. It is readily known from the other Japanese species by its strong teeth. It may be that the unrecognized species, *Sciæna japonica*, is identical with the species. But the great difference in the size of the eye, and the fact that *Sciæna nibe* is sexually mature at a foot in length make this identification very improbable.

(*Nibe*, the Japanese name of large fishes of this group, from *nibe*, isinglass, made from the large air bladder of Sciænoid fishes. Nibe is used to bind bamboo sticks together.)

7. SCIÆNA JAPONICA Temminck and Schlegel.

Sciæna japonica TEMMINCK and SCHLEGEL, Fauna Japonica, Poissons, 1843, p. 58, pl. 24, fig. 1; Nagasaki, on a poor Japanese drawing sent by Bürger to Schlegel.

Habitat.—Southern Japan.

Schlegel has published a crude drawing of a species he calls *Sciæna japonica*. The species has not been recognized. According to the drawing, the body is elongate, the depth about 4, the head small, the eye very small, the mouth moderate with rather strong teeth and subequal jaws. The dorsal rays are X—II, 26, the anal II, 8, the second anal spine small. The color is plain gray, paler below. According to Bürger it reaches a length of 4 to 5 feet, and its depth is 10 inches to 1 foot. It is said to be known as Nobe, which is probably an error for Nibe, the usual name for the larger Sciænoids in Japan. It is taken in the spring in southern Japan, and is excellent as food. It is eaten boiled.

If any such giant Sciænoid occurs about Nagasaki, it may be recognized as *Sciæna japonica*. As the figure is of the crudest description and the species thus far unknown, Steindachner suggests that it should be erased from the system. It, however, resembles in some degree the species obtained by us at Wakanoura, which we call *Sciæna nibe*. Our species is, however, much deeper in body with much larger eye and a female example has mature ova at the length of a foot.

There is no reason for supposing *Sciæna japonica* to be the same as *Sciæna argentata* (*bleekeri*) as Steindachner has suggested. Still less can it be identified with *Otolithes argenteus*, as suggested by Doctor Günther.

SUMMARY.

Family SCIÆNIDÆ.

1. *Bairdiella* Gill, 1861.

§ *Nector* Jordan and Evermann, 1898.

1. *acanthodes* (Bleeker), 1879.

2. *Sciæna* (Artedi) Linnæus, 1758.

§ *Nibea* Jordan and Thompson, 1910.

2. *mitsukurii* (Jordan and Snyder), 1901.
   Matsushima, Tokyo, Awa, Wakanóura.
3. *albiflora* (Richardson), 1846.
   Port Arthur.
4. *argentata* (Houttuyn), 1782.

§ *Argyrosomus* De la Pylaie.

5. *schlegeli* (Bleeker), 1879.
   Tokyo, Onomichi, Tsuruga, Naoetsu, Hiroshima, Kawatana, Nagasaki.

§ *Othonias* Jordan and Thompson.

5*b*. *manchurica* Jordan and Thompson, Port Arthur.

6. *nibe* Jordan and Thompson, 1910.
   Wakanoura.
7. *japonica* Temminck and Schlegel, 1843.